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Grand Teton National Park

Wyoming

Fuels Reduction Projects

Environmental Assessment

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Grand Teton

National Park • Wyoming

SUMMARY

The Grand Teton National Park fuels reduction demonstration project is a combination of seven small fuels management projects totaling 89 acres between Moran and Moose, in mixed conifer and sage fuels. The park proposes to treat these 89 acres by creating shaded fuel breaks in mixed conifer fuels and increasing spacing by mowing sage fuels.

The purpose of the projects is to provide protection of structures from fire in the wildland urban interface. This Environmental Assessment (EA) examines two alternatives: Alternative 1 – No Pre-Fire Treatment (No Action Alternative) and Alternative 2 – Mechanical Fuels Treatment with Pile Burning (Proposed Action). Two other alternatives were considered, but rejected during internal scoping due to their infeasibility and ineffectiveness. Neither public scoping nor consultation with several other agencies indicated additional alternative uses of available resources or other significant strategies, issues or unresolved conflicts; therefore, other alternatives were not evaluated. Implementation of Alternative 2 would reduce the risk of wildland fire to structures and the environment while providing for firefighter safety, reduced risk to human life and protection of property. This alternative poses minor and relatively short-term effects to air quality, vegetation, and wildlife habitat, yet has the potential to moderately affect employee and public safety in a beneficial way. It poses negligible effects to T&E species and cultural resources.

PUBLIC COMMENT

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. This environmental assessment will be on public review for 30 days. Please note that names and addresses of people who comment become part of the public record. **If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

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1.0 Need for the Proposed Action

These projects are needed to provide protection of structures from fire in the wildland urban interface, to reduce the risk to structures, and the natural environment from wildland fire while providing for firefighter and public safety. Wildland fires in these urban interface areas are very difficult and costly to manage. Structures in the urban interface include National Register of Historic Places eligible and listed properties, Park Service properties, and private property. High financial and esthetic values are associated with these areas. Protecting them from fire is complex and costly. Most importantly, fires within this interface pose a significant safety risk to the public as well as federal, state, and local firefighters assigned. Creating defensible space around structures and providing safe access for response maneuverability and egress can reduce risk to human life and provide for the protection of property.

Existing Condition

The existing condition regarding heavy fuels within the park is outlined as follows:

- Heavy fuels exist near developed areas such that there is an increasing risk to life and property.
- Continuous areas of advanced seral stage vegetation reduce alternatives for fire management and for protecting park resources or other values.

Pre-Treatment fuel loading estimated at 20 tons/acre

The project areas contain large amounts of dead and down ground fuels, closely spaced trees with interlocking crowns, dead standing snags, and numerous small trees in the understory. These conditions require fuels reduction to change fire behavior, reducing flame lengths and fire intensity, in order to create conditions more favorable for fire suppression operations. During fires, current conditions contribute to high flammability and resistance to control by fire crews and equipment. When these fuels lie in close proximity to inholdings, historic buildings, private structures and property, there is a high risk that fire will consume the structures and limit fire management containment options. Cultural landscapes may be restored back to reference (historical) conditions by treating the vegetation in the areas around historic complexes.

Desired Future Condition

The desired future condition is one which reduces risk to structures and provides for firefighter safety. The following characteristics are required in order to achieve these conditions:

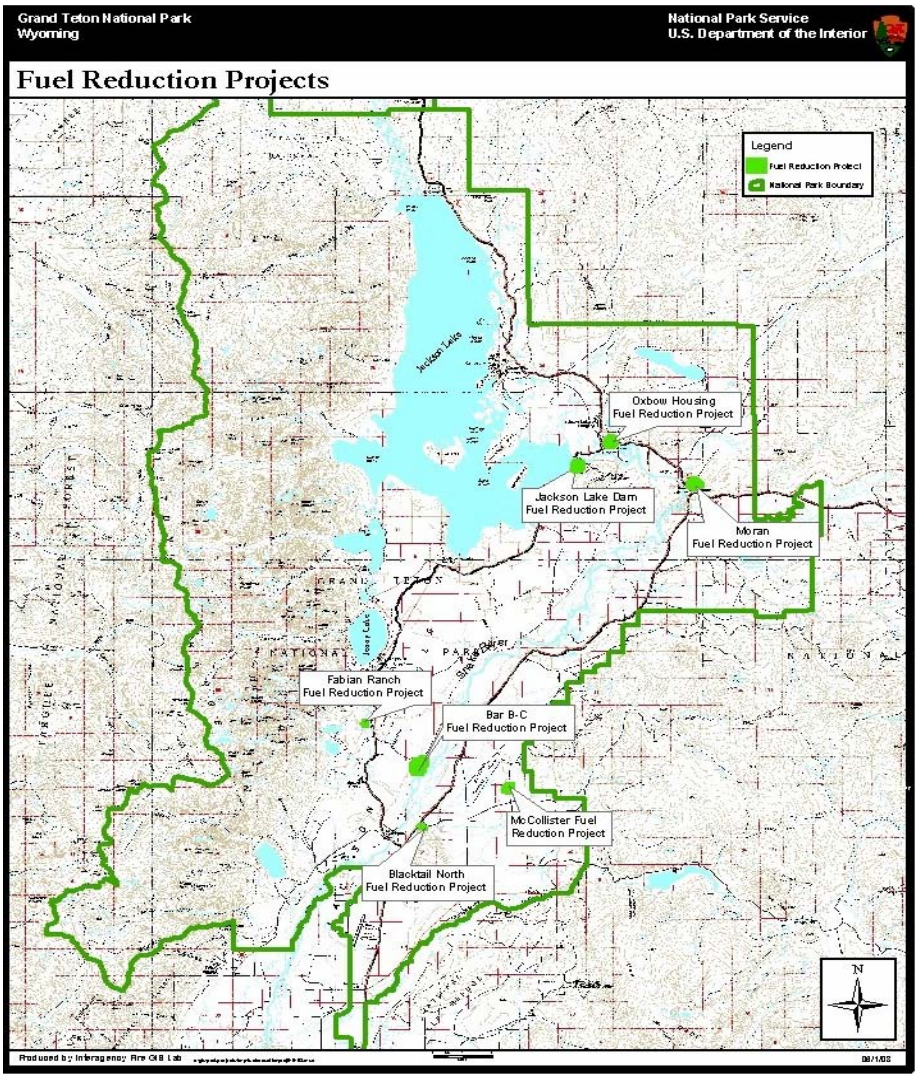
Post-treatment fuel loading estimated at <10 tons/acre

- Flame lengths are less than 4 feet so firefighters can use hand tools to protect structures.
- Direct flame impingement to structures is limited.
- Spotting and torching of trees that could ignite the structures is limited.
- Efficient and safe tactical access to and egress from the structures is available.
- A safe environment is maintained such that risk to personnel is minimized when protecting structures.
- Visual integrity of the site is attained and local plant communities are maintained as much as possible.

2.0 ALTERNATIVES

The decision to be made is whether and to what extent mechanical treatment should be applied to these seven specific areas of the park.

Figure 1: Seven project sites located within Grand Teton



Alternative 1 – No Pre-Fire Treatment (No Action Alternative)

This alternative involves no prior treatment, and currently no prior treatment is authorized in the existing Hazardous Fuel Management Plan (1991) without conducting a full environmental analysis. Presently, an aggressive public education program is in place with outreach to the local community.

Fuels are primarily in Fire Regime III and Condition Class 2. Without treatment or action, fuels accumulations will continue to increase in and adjacent to a number of historic structures, private residences, government offices, government housing units and Bureau of Reclamation properties in Grand Teton National Park (GTNP). Greater risk and compromised safety are inherent to the public and firefighters when suppressing fires at these sites due to the high intensity fires that dense vegetation and a build up of dead and down fuels create.

Under all normal fire weather conditions, fire spread will not likely be limited to a low intensity ground fire that can be attacked by firefighters on the ground. Heavier fuels with higher crown potential and longer flame lengths will create torching trees, and increase the potential for a fire to develop into a crown fire. The no action alternative promotes increasingly dangerous conditions that increase risk to structures, firefighters and the public. This alternative is costly in the long term in regards to response effectiveness and loss of structures. This alternative is not consistent with National Policy. A decision to continue with the no action alternative will not adequately protect life and property and poses higher risk to fire fighters and the public.

Alternative 2 – Mechanical Fuels Treatment with Pile Burning (Proposed Action)

The proposed action is to conduct treatment prior to a fire start by mechanically reducing fuels adjacent to structures to current standards (Appendix E). The only prescribed fire component of these projects will be the burning of piles that have been generated by mechanical treatments.

The park proposes to mechanically treat seven sites (Figure 1) totaling 89 acres between Moran and Moose by creating shaded fuel breaks in mixed conifer fuels and increasing spacing by

mowing sage fuels. Treatments will include a combination of cutting and piling of live vegetation, piling of dead vegetation, pile burning, and fuel break mowing. All treatments except the mowing will be conducted by hand crews using chain and handsaws to cut the debris into manageable lengths and will be focused near structures. The seven projects are:

Blacktail North:
Douglas fir stand on the north slope of Blacktail Butte will be treated to aid in protecting private inholdings in the event of wildland fire on Blacktail Butte.

Jackson Lake Dam:
Mixed conifer, lodgepole pine, and Douglas fir along the north slope of Signal Mountain will be treated to aid in protecting structures associated with the Jackson Lake Dam. The proposed treatment is:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Ladder fuel removal up to 10 feet or half the height of the tree, which ever is less. Targeted ladder fuels are limbs or low branches that reach to the ground providing an avenue for fire to move from the ground into tree crowns. Tall shrubs may also act as ladders but will not be specifically targeted with this treatment. Some shrub removal may be completed to allow for safe working and pile placement.
- Regeneration reduction focusing on trees 0-3 inches in diameter to create 10-12 feet between individual trees or groups of trees. This treatment area contains little regeneration in the 0-3 foot height class but moderate to heavy regeneration in the "pole" category 10+ feet in height.
- Maintain/create overstory tree spacing of 10-12 feet between tree stems. This stand is currently stocked to higher densities, which will require thinning of overstory trees to reduce the possibility of active crown fire.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 8-10 feet in diameter at a density of 10-12 piles/acre based on pre-treatment estimates.

McCollister:
Aspen stand with some conifer regeneration on the west side of Shadow Mountain in Antelope Flats. The treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Reduce conifer seedlings and poles within the aspen stand.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing most vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 8-10 piles/acre based on pre-treatment estimates.

Bar B C:
Combination of mechanical thinning and mowing will reduce sagebrush densities and vegetation immediately adjacent to structures in the historic Bar B C Ranch area. The treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Reduce conifer seedlings and poles within aspen stands.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.
- In areas of dense sagebrush, removal of sagebrush within 30 feet of the structure should be combined with thinning sagebrush for an additional 40-70 feet outside the cleared area. Thinning should create clumps of sagebrush separated by open areas with clump size no larger than 15 feet in diameter and openings no less than 15 feet.
- Prescribed burn project will extend the defensible space to the south of the development.

Material produced will be piled in natural openings and clearings and allowed to cure for 2 summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 4-5 piles/acre based on pre-treatment estimates.

Fabian Ranch:
Cottonwood and conifer riparian area with aspen and conifer regeneration will be treated adjacent to the structures associated with the Fabian Place. The treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 4-5 piles/acre based on pre-treatment estimates.

Oxbow Housing (Jackson Lake Ranger Station):
Lodgepole pine/mixed conifer will be treated adjacent to structures associated with NPS housing and historic structures. Treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Ladder fuel removal up to 10 feet or half the height of the tree, which ever is less. Targeted ladder fuels are limbs or low branches that reach to the ground providing an avenue for fire

to move from the ground into tree crowns. Tall shrubs may also act as ladders but will not be specifically targeted with this treatment. Some shrub removal may be completed to allow for safe working and pile placement.
- Regeneration reduction focusing on trees 0-3 inches in diameter to create 10-12 feet between individual trees or groups of trees. This treatment area contains little regeneration in the 0-3 foot height class but moderate to heavy regeneration in the "pole" category 10+ feet in height.
- Maintain/create overstory tree spacing of 10-12 feet between tree stems. This stand is currently stocked to higher densities, which will require thinning of overstory trees to reduce the possibility of active crown fire.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 8-10 piles/acre based on pre-treatment estimates.

Moran:
Lodgepole pine forest around the NPS housing area and the Snake River Land Company residence (also known as the Buffalo Dorm) at Moran will be treated. The treatment priorities are:
- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre or less remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Remove/reduce conifer regeneration where it is dense so that some regeneration remains to continue to provide visual screening for the residences from the road. This will generally mean reducing regeneration clumps by about ½ their original density.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.

Material produced will be piled in natural openings and clearings and allowed to cure for 2 summers. Once cured, these piles will be burned in accordance with the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 8-10 piles/acre based on pre-treatment estimates.

Several mitigation measures, described in the Environmental Consequences section and detailed in Appendix G, will be implemented at all sites as part of the proposed action.

Alternatives Considered But Rejected

Prescribed Burning – Use prescribed burning in treatment areas. Prescribed burning these project treatment areas will not work due to high risk to structures and the potential for increased impacts to vegetation with higher intensity fires. These sites have a significant enough existing fuel loading to render prescribed burning very risky to both personnel safety and the structures they surround.

Modify Structures – Modify specific components of structures to reduce fire potential (i.e. by changing roof types from wood to metal, etc.) This proposal was dismissed due to historic structure rehabilitation and repair constraints, excessive cost, the inability to change private residences (historic or not) and the lack of any effect on fire behavior.

These alternatives were considered, but rejected during internal scoping due to their infeasibility and ineffectiveness. Neither public scoping nor consultation with several other agencies indicated additional alternative uses of available resources or other significant strategies, issues or unresolved conflicts; therefore, other alternatives were not evaluated.

3.0 ENVIRONMENTAL CONSEQUENCES

Assumptions, Methodologies and Terminology for Evaluating Impacts

This section contains the scientific and analytical foundation for comparison of the effects of the alternatives. For each impact topic this chapter first explains the affected environment for all impact topics. Then for each alternative it discloses direct, indirect, and cumulative environmental effects for the resource impact topics including effects on the human environment. The analysis includes a description of whether effects are beneficial or adverse and short- or long-term. The magnitude of the effect also is described in terms ranging from negligible to major. The definition of the level or magnitude of the impact may vary between impact topics so individual definitions are provided for each. Refer to Table 2 in Appendix D for a summary comparison of impacts of the alternatives. The park boundary, encompassing 310,000 acres, was used as cumulative effects area since all the project sites were located within the boundary and the park maintains control over fire management within this area.

The National Park Service Intermountain Region has established guidance in the form of sample methodologies and impact threshold definitions used throughout the Intermountain Region. This guidance serves to provide general definitions for a range of impacts as they relate to various resource topics. Each individual park unit is encouraged to use this guidance, but to tailor them so that they are applicable to the specific characteristics of the unit's resources and environment. In most cases, the impact threshold definitions used in this analysis were derived from this guidance and modified slightly by park professionals with field expertise in each of the resource topic fields. Best professional judgment is applied based on personal knowledge of the resource and experience in the field. The impact threshold table on invasive species was developed using park-specific resource characteristics knowledge, since existing guidance did not have threshold impact definitions available.

Impairment of Park Resources or Values

National Park Service (NPS) policy (*Directors Order 55: Interpreting the National Park Service Organic Act*) requires analysis of potential effects to determine whether or not actions would impair park resources. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be more likely to constitute impairment to the extent it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impact Topics Analyzed in this Environmental Assessment

Specific impact topics were developed to ensure that alternatives were compared on the basis of their effects that are most relevant to a determination whether or not the proposed action may have significant environmental effects. The impact topics are air quality; historic structures; archeological resources; vegetation; wildlife and habitats, including threatened, endangered, and special concern species; and firefighter and public safety. The impact topics that do not warrant further analysis are addressed in Appendix B.

AIR QUALITY

Affected Environment

Air quality and visibility in Grand Teton National Park is generally excellent, although occasional periods of haze or smoke of local and interstate origins occur throughout the year. The area of concern in respect to air resources consists of the entire air shed throughout the Greater Yellowstone Ecosystem (GYE). At times air quality and visibility will be affected by smoke from wildland fires, including prescribed burns, wildland fire use actions, and wildland fires that occur in the surrounding area. Air pollutants originating from regional and local sources, from the anticipated growth in the Jackson Hole area, and from increasing park visitation could also add to air quality impacts. See Appendix C for a description of regulatory requirements and the State of Wyoming's air quality program. The air quality impacts associated with pile burning were assessed qualitatively.

Impact Threshold	Air Quality Definition of Impacts
Negligible	The impact on air quality is not measurable or perceptible.
Minor	The impact on air quality is measurable or perceptible and is localized in a relatively small area within the Greater Yellowstone Ecosystem (GYE) air shed.
Moderate	The impact is sufficient to cause a change in exposure to emission levels, but is localized within the Greater Yellowstone Ecosystem (GYE) air shed. The change is measurable and perceptible but could be reversed by various mitigation measures.
Major	The impact is substantial, highly noticeable and may be permanent or un-mitigatable.

Effects of Alternative 1 – No Action

Because the no action alternative does not include mechanical treatment or pile burning, there are no direct impacts to air quality. However, the indirect smoke and visibility impacts of no action may be moderate, adverse, and long-term if fuels continue to build at these sites and a wildland fire reaches these areas. These moderate effects would be in the form of particulate emissions, poor visibility and smoke.

Effects of Alternative 2 – Proposed Action

The level of impact on air quality will depend on the stability, speed, and direction of the wind and the duration of the burning of piled fuels. Short-term effects will be minor and adverse on the overall air quality in the park compared to other pollution sources, such as vehicle air emissions and typical urban air emission sources. The emissions will be short-term impacts due to pile burning, which generally last less than 12 hours. Any emissions would likely be dissipated quickly since air stagnation is rare in this area and no measurable reduction in the regional visual range would be anticipated. Fuels will be allowed adequate time to cure completely to reduce the amount of smoke. Firewood sales will be considered in order to reduce the amount of fuels being burned and the number of piles burned per day will be in compliance with state permits and limited in order to reduce impacts to air quality. Residents and visitors will be given advanced notice when burning is planned. The proposed action will result in direct, adverse,

minor short-term effects on the overall air quality in the park compared to other pollution sources.

Cumulative impacts are the same as in the no action alternative described above. Emissions caused by the proposed actions would be short-term, localized, and have a negligible additive effect on the overall air quality in the park compared to other typical pollution sources in urban and recreational areas. Historically, the WY permit/monitoring program has been very effective in maintaining high air quality and visibility standards throughout the region.

ARCHEOLOGICAL RESOURCES AND HISTORIC STRUCTURES

Affected Environment

Grand Teton National Park encompasses a variety of archeological resources. Both prehistoric and historic resources can be found in the park. The seven project sites were completely surveyed and no new sites were found. Only one small dump site at Bar B C was listed as a potential concern (site 48TE1623); this site will be flagged and protected. All the sites except for the Jackson Lake Dam site have historic structures and buildings listed in, or eligible for listing in, the National Register of Historic Places. Appendix C provides more specific information about the affected environment of these resources, their identification and their evaluation in accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*).

Impact Threshold	Cultural Resources Definition of Impact
Negligible	The impact on cultural resources is at the lowest levels of detection, barely perceptible and not measurable.
Minor	The impact on cultural resources is measurable or perceptible, but it is slight and localized within a relatively small area of a site or group of sites. The effect would not be harmful to those characteristics that qualify the property for inclusion in the National Register.
Moderate	The impact is measurable and perceptible. The effect could alter a character-defining feature, but the integrity of the resource would be retained, including its NR eligibility.
Major	The impact on cultural resources is substantial, noticeable, and permanent. The impact is severe or of exceptional benefit. The effect could diminish the integrity or characteristics that qualify the property for inclusion in the National Register.

Effects of Alternative 1 – No Action

Although the no action alternative poses no direct adverse effects on archeological resources, historic structures at these sites are at a greater risk every year that no action is taken. The primary purpose of the fuels reduction projects is to protect life and structures and the secondary goal is to restore vegetation back to natural processes and cultural landscapes back to reference conditions. Neither of these may be achieved through no action. The indirect impacts of no action could be moderate, adverse, and long term if fuels continue to build at these sites and a wildland fire reaches these areas.

Indirect, moderate effects could occur in the future or long term due to fuels build up and the inability to suppress these conditions in the event of a wildland fire. These moderate effects would be in the form of partial or total destruction of historic structures and exposure of archeological resources previously hidden by ground vegetation that would no longer exist. There are no anticipated cumulative impacts in the reasonably foreseeable future.

Effects of Alternative 2 – Proposed Action

A Class III Cultural Resource Inventory was conducted by the Office of the Wyoming State Archeologist (OWSA) for all seven project locations over the last two years. Every site was completely surveyed within the project scope areas and no additional cultural resources were located except at Bar B C. At all of the locations, no further work was recommended. At each location, the determination was made that the proposed action would have no adverse effect

on archeological resources or historic structures and a cultural clearance was recommended and approved by the State Historic Preservation Office (SHPO). There would be negligible or no effect to archeological resources in Alternative 2. There would be an indirect, long-term, moderate, beneficial impact for historic structures. Reducing the fuels around these structures will reduce the risk of unmanageable fires that could take over these structures and destroy them. There are no past, present, or reasonably foreseeable future actions that would have cumulative impacts on these resources.

VEGETATION

Affected Environment

The McCollister site contains Aspen, mature trees with even canopy and little mortality. Bar B C and Fabian contain Sagebrush, primarily big sagebrush interspersed with low sagebrush, rabbit brush, and antelope bitterbrush; understory of shrubs, grasses and forbs. All the project sites, except Bar B C, contain spruce/fir stands dominated by Engelmann spruce and subalpine fir in both overstory and understory; lodgepole pine, and Douglas fir. McCollister, Oxbow, Moran, and Jackson Lake Dam Housing all contain existing roads, parking, and buildings with no affected plant communities.

The spread of non-native invasive species is a tremendous, on-going problem throughout the highly visited and occupied portions of the park. Many of these noxious weeds thrive in newly or highly disturbed areas. Musk and Canada thistle and knapweed are of primary concern, due to their preference to burned areas and areas with less shading.

Analysis of impacts on vegetation resources was based on the potential for the introduction of invasive non-native species and the amount of disturbance and/or removal of vegetation. The amount and location of direct disturbance (tree limbing and thinning, removal of dead and down, and pile burning) resulting from the proposed action would primarily cause beneficial effects to that resource, therefore analysis of adverse impacts were primarily focused on the potential for non-native species to spread after treatments. The likelihood of occurrence of species of special concern in or around the project areas is very low and observations revealed none of the species in these areas to date. No plants protected by the Endangered Species Act (ESA) have been recorded in the project areas.

Impact Threshold	Invasive Non-Native Species Definition of Impact
Negligible	No or barely detectable increases in the number of nonnative species and extent of their range. Effects short-term and limited to a small area and not measurable.
Minor Effect	Changes in the extent of nonnative species domination short-term, localized, and measurable to one or more species. Mitigation of effects would be simple and effective, measured according vegetation specialist objectives.
Moderate Effect	Less than half of fire management activity treatment areas would be colonized by invasive nonnative species over a relatively long period of time. Mitigation would be extensive, but likely successful in eliminating and/or controlling the spread as appropriate per species.
Major Effect	More than half of fire management activity treatment areas would be colonized by invasive nonnative species over an extended period of time. Mitigation would be extensive, but its success is not assured.

Effects of Alternative 1 – No Action

This alternative would not result in any new impacts on vegetation by the spread of invasive nonnative species or disturbance of vegetation. In the long term, no action increases the potential for high intensity fires that will be hard to suppress, resulting in a higher risk of total loss of vegetation in the seven project areas. This indirect effect of no action could be moderate and adverse and cumulative in areas with surrounding high-density vegetation, due to the potential for rapid spread experienced in the past after high intensity burns.

The no-action alternative implies continuance of current conditions and current management and exacerbation of the currently overstocked fuels conditions. Ignitions can be anticipated to move both on to and out off the wildland urban interface in the absence of human-made or natural barrier to fire. Residents may participate in vegetation removal and disposal for beautification and fire safety. Vegetation is also generally cleared in installation and maintenance of utility corridors. These cumulative actions, however, are collectively negligible.

Effects of Alternative 2 – Proposed Action

A total of 89 acres will be treated by thinning, mowing, or removing/burning dead and down materials. Piles of vegetation cut or down will be generated and burned after a year or two of drying. Burn piles are range generally 6-12 feet in diameter. These burn piles are the primary affected area where nonnative and invasive species have the potential to increase. Several piles (generally 4 to 12, sometimes up to 20) are generated per acre, depending on the amount of fuel reduction required in each specific location. The estimated total acreage of all the burn piles combined is less than 1 acre or 43,560 square feet. The likelihood of special species of concern within the project areas is very low per personal consultation with the Park Vegetation Specialist.

The mechanical treatments will not reduce the vegetative cover completely or cause a total loss of the existing vegetation; they will only thin out existing cover and remove dead and down material. The proposed action would reduce the potential for high intensity wildfires that would be hard to suppress and that may result in the total loss of vegetation in the project sites. Mitigation measures such as noxious weed treatments would limit impacts to a negligible level over the long term. Appendix G further details mitigation measures addressing noxious weed treatment methods. Therefore, the effect to vegetation by the spread of invasive nonnative species would be direct, adverse, minor and short-term in nature and direct, beneficial, minor and short-term for trees that were treated in the area.

Fuel reduction work and wildland fire within the park may continue to create openness and patchiness within the park's landscape and also increase the potential for the spread of noxious weeds by way of creating less opportunity for competition with other plants. Other development and visitor activities have the potential to increase the spread of weeds as well, although the cumulative effect is negligible in size and intensity.

WILDLIFE AND HABITAT (Including Threatened, Endangered, and Special Concern Species)

Affected Environment

Grand Teton National Park provides habitat for a variety of wildlife species, including 61 mammals, 4 reptiles, 6 amphibians, 19 fish, and 299 species of birds (NPS 2000). Although many of these could occur in the project areas due to the diverse habitat mixture of woodland and sagebrush steppe communities present, the project areas are not considered suitable habitat for most wildlife due to the proximity to urbanization with either high visitation or people currently living in the area. Potential residents include ungulates (elk, moose, bison, mule deer, white-tailed deer, pronghorn), rodents (beavers, muskrats, porcupines, ground squirrels, red squirrels, chipmunks, mice, and voles), and other small mammals. Bird species of interest, such as bald eagles, northern goshawks, owls, and sage grouse have not been observed nesting in the project areas and are unlikely to inhabit these areas in the immediate vicinity.

Grand Teton National Park contains five species listed under the Endangered Species Act (ESA) as threatened, endangered, or proposed. The mountain plover is listed as proposed, the bald eagle, Canada lynx, grizzly bear, and gray wolf as threatened (NPS 2003). Sage Grouse is the only state-listed species of concern that warrants analysis within the park. Additional information on the five species listed under ESA and the sage grouse may be found in Appendix C. A Biological Assessment (BA) was completed for T&E species and the sage grouse, a species of

special concern. A detailed analysis of effects is addressed in the BA from which the following summary of effects is based. The BA was submitted to the U.S. Fish & Wildlife Service and the non-sensitive portions are available upon request from the GTNP Planning Office.

The effect analyses for wildlife were based on several factors. These were: (1) the known or likely occurrence of a species or its habitat in the affected area, (2) the loss of wildlife due to treatment activities, (3) the direct loss of habitat due to tree thinning or ground disturbance, and (4) the effective loss of habitat (through avoidance or abandonment by wildlife) in the area due to treatment activities and noise.

Impact Threshold	Wildlife and Habitat Definition of Impacts
Negligible	An action that either does not affect species; or may affect a population or individuals of a species, but the effect will be so small that it will not be of any measurable or perceptible consequence to the population.
Minor	An action that may affect a population or individuals of a species, but the effect will be small; if it is measurable; it will be a small and localized consequence to the population.
Moderate	An action that will affect a population or individuals of a species; the effect will be measurable and will have a sufficient consequence to the population but is more localized.
Major	An action that will noticeably affect a population or individuals of a species; the effect will be measurable and will have a substantial and possible permanent consequence to the population.

Effects of Alternative 1 – No Action

Under the no action alternative, not treating at the project sites would not directly influence species near the sites. Continued growth of vegetation, however, would increase the long-term risk of total wildlife habitat destruction due to fire intensity and reduced ability to suppress such fires. Wildlife may also be adversely affected either directly by the increased potential for wildland fire kills or indirectly by destruction of their habitat by wildland fire. This effect is likely to cause a long-term moderate adverse impact.

Major fire operations resulting in fighting fires at the seven project sites or total habitat destruction in the event of a wildland fire at two of these locations have the potential to cause an indirect, adverse, and moderate effect.

Current recreational activities may disturb or displace typical T&E species activities, but the adverse impact is considered minor and short-term due to mitigation measures in place to address the impacts of these activities, i.e. access restrictions, area closures, and educational programs for visitors and employees. Anticipated growth in the nearby Jackson and Teton Village areas would probably result in the conversion of land outside the park from a natural to a developed state. Future development could increasingly displace wildlife populations and reduce diversity and cumulatively effective habitat.

Effects of Alternative 2 – Proposed Action on Wildlife and Habitat

Fuels treatment activities may cause the destruction of burrowing animal habitat and the nests of some ground-nesting birds. Increases in noise and the level of human activity would temporarily displace species sensitive to human disturbance. Mitigation measures will be taken to identify and avoid any ground nests in or around any dead and down materials, or low lying branches. These short-term impacts would be direct, very localized, adverse, minor and short-term, since they would not have a principal effect at the population level on biological resources and habitat.

The primary long-term effects of the fuels treatment activities include wildlife avoidance and displacement of habitat within 30 to 300 feet of existing structures. The thinned areas will have

less dead and down materials for smaller mammals to use to hide under and store food. The avoidance of this area by wildlife would continue to result in negligible to minor adverse effects on individual animals and wildlife populations. The small portion of slightly modified habitat would not adversely influence species near the sites given the current level of human activity. Although impacts on wildlife will be slightly detectable due to displacement and habitat modification, alternate habitat is readily available and effects on individuals of a species will not have an adverse impact on overall populations. Minor, long-term, adverse impacts would result from the displacement of wildlife and modification of habitat.

The primary area of concern regarding T&E wildlife and ecological systems in GTNP is that of wildlife habitat for lynx and the location of eagles' nests. Fuels treatment activities may disturb habitat or displace typical T&E species activities due to human presence and noise, but the impact is considered minor and short-term. Mitigation measures regarding the management of food and behavior while in these areas will be implemented to minimize any potential contact with grizzlies, lynx or wolves as outlined in the BA. Bald eagle nests are not located within 0.5 mile of the sites and treatment activities will be limited to the period of August 16 to October 31 at the three project sites where nests are within 1 mile of the project area. Furthermore, no airplane or helicopter overflights will be conducted. Although unlikely, potential travel corridors may be affected for a period of up to 2 weeks, however, this effect is short-term.

After mechanical treatments are complete at Moran and Oxbow Housing areas, no long-term effects are anticipated. Potential effects are based primarily on the noise of mechanical equipment; however, these are short term. Because human development and activities already characterize these sites, long-term cumulative effects would be negligible. Treated areas will have a higher visibility than untreated areas, thus posing potentially less desirable habitat for denning and foraging of most animals. Generally, the treatment sites are too close to human presence and structures for denning. Treated areas will also modify the habitat for typical lynx prey, such as snowshoe hare and other smaller mammals. Because the habitat modified is relatively small, in comparison to the adjacent suitable habitat where these animals can relocate, the effect to potential foraging habitat is considered adverse, long-term and negligible. No long-term impacts to bald eagles are anticipated. Current recreational activities may disturb or displace typical T&E species activities, but the impact is considered minor and short-term due to mitigation measures in place to address the impacts of these activities, i.e. access restrictions, area closures, and educational programs for visitors and employees.

Bar B C is the only site where sagebrush will be mowed. Mowing will not kill the vegetation, but reduce its size and its ability to provide adequate cover. The primary short-term effects of mowing include avoidance of this habitat for foraging due to human presence and noise. Under this action alternative, fuels treatment activities would not adversely influence the species near the site given the current level of human activity. There would be short-term, direct, negligible and adverse effects on these species due to their avoidance of human activities. Since the sage brush at Bar B C is not considered critical habitat and sage grouse have not been observed in this area, the effect on sage grouse is considered to be negligible.

Mowing will take away the necessary cover required for safe nesting. Although foraging opportunities will decrease in the short-term, they will be improved in the long-term by providing a more open habitat for finding food. Negligible, long-term, adverse impacts would result from the loss of nesting habitat. However, impacts on sage grouse nesting will not be detectable due to the current absence of nests in the area. Alternate habitat is available and effects on individuals of a species are unlikely and will not have an adverse impact on overall populations.

The combined effect of all activities is not likely to cause an adverse cumulative impact on federally listed species because of the conservation efforts or mitigation measures that would be taken for this project and those taken for other activities in the surrounding area. In both alternatives, long-term impacts on sensitive species would either not occur or would be negligible to minor. Therefore, there would be no additive cumulative impact on sensitive species associated with the proposed action.

FIREFIGHTER AND PUBLIC SAFETY

Affected Environment

Current conditions around these sites pose high risks to firefighter and resident safety, as well as the safety of visitors and access issues. Residents live in or immediately adjacent to the Blacktail North, Oxbow Housing, Moran and Jackson Lake Dam sites. Visitors and especially the structures they are visiting are at high risk of fire at the Fabian Ranch and the Bar B C Ranch sites.

Firefighter safety is determined using fire intensity and behavior and access (topographic and spatial) around the structures they are trying to protect. Public safety for visitors and employees is analyzed using ability to egress quickly and communication effectiveness. Safety to residents living within the project areas is assessed using fire behavior, ability to egress quickly, and the effectiveness of education and communication tools.

Impact Threshold	Firefighter and Public Safety Definition of Impacts
Negligible	Public safety would not be affected, or effects are at low levels of risk detection and would not have an appreciable effect. Exposure to firefighters would be minimal when complying with the 10 Standard Firefighting Orders.
Minor	An action where risk to public safety could be affected. Some visitors would be aware of some level of risk, but levels would be low and mitigation highly successful. Exposure to firefighters would be minimal when complying with the 10 Standard Firefighting Orders and observing the "Watch Out" situations.
Moderate	An action that would be readily apparent resulting in noticeable effects on risk levels to public safety locally. Mitigation measures are necessary and likely successful. Exposure to firefighters would be mitigated by *Lookouts, Communications, Escape Routes, and Safety Zones* (LCES) process, risk analysis, and data report recommendations.
Major	An action that would cause a severe change to levels of risk for public safety. The change would be measurable in time or operational funds and would have substantial effect. Mitigation measures to offset adverse effects would be needed with success not assured. Hazards to firefighters would be mitigated by establishing engagement and disengagement guidelines.

Effects of Alternative 1 – No Action

Under Alternative 1, no mechanical treatments would take place around the structures that park staff, residents, and visitors occupy within the projects areas. The existing conditions around these structures pose an increasingly high risk to life and property. Under all normal fire weather conditions, fire spread will not likely be limited to a low intensity ground fire that can be attacked by firefighters on the ground. Heavier fuels with higher crown potential and longer flame lengths will create torching trees, and increase the potential for a fire to develop into a crown fire. The no action alternative promotes increasingly dangerous conditions that increase risk to structures, firefighters and the public. These sites pose high risks to the residents and the firefighters, due to difficulty of access issues. The no action alternative does not result in a direct effect; however, its indirect effect is adverse, moderate, and possibly long-term in the event of a wildland fire.

In the long term, the fuel loading will increase in and around these areas and will prove more costly in regards to response effectiveness and loss of structures. Moreover, employee and public safety are at a much greater risk of being impacted by approaching wildland fire in these

conditions, which limits or sometimes denies efficient tactical access to structures. This alternative is inconsistent with National Policy and a decision to continue with the no action alternative will not adequately protect life and property and poses higher risk to fire fighters and the public.

Fuelbreaks constructed in concert with ongoing fuels reduction activities in the park will increase the area of defensible space for points of concern and safety for firefighters and the public, according to the Forest Service publication in 2000 called "*Protecting people and sustaining resources in fire-adapted ecosystems: a cohesive study*." However, the cumulative effect of these activities is negligible in size in comparison with a cumulative effects area of 310,000 acres, the area of Grand Teton National Park.

Effects of Alternative 2 – Proposed Action

Under Alternative 2, mechanical treatments would take place around the structures that park staff, residents, and visitors occupy within the project areas and is consistent with national fire policies. By limiting direct flame impingement to structures, reducing flame lengths to less than 4 feet so firefighters can use hand tools to protect structures, and limiting spotting and torching of trees that could impact the structures, the treatments will reduce fire behavior and reduce the risk to life safety and structures as much as possible. The treatments also will provide efficient and safe tactical access to the structures and maintain a safe environment such that risk to personnel is minimized when protecting structures against fire.

Current fuel loading conditions around these sites pose higher risk to firefighter and resident safety, as well as the safety of visitors. The proposed action alternative mitigates these potential impacts, resulting in a direct, beneficial, moderate, long-term effect.

Although more costly than the no action alternative in the short term, it provides a long term cost savings by preventing the loss of structures and decreasing fire response expenses. Treating these seven sites may create a long-term, beneficial effect in the form of a barrier or slower burning area in the event of a large wildland fire in their respective locations. Firefighters may be able to apply more resources to other locations in the vicinity of these project areas because these areas will require minimal firefighting resources after treatment. These areas increase fire management options for wildland fire use and suppression which is consistent with Wildland Fire Management Plan objectives.

The cumulative effect of treating 89 acres in addition to other on-going fuels reduction activities in the park to reduce risk to public and firefighter safety within these specific site locations would be moderate, since the proposed action would be very effective in reducing risk in these areas.

Conclusion - Impairment Determination

<u>Alternative 1 – No Action Alternative</u>

Although the risk to structures and firefighter and public safety increases with no action in the event of a wildland fire, this alternative does not pose any significant, adverse, direct or indirect impacts to natural, cultural, and social resources. The *potential or indirect effects* are estimated to be negligible to moderate (for historic structures and public/firefighter safety), but these are only *if* a wildland fire occurs in these areas in the future. This alternative is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat. Alternative 1 would not result in impairment to any natural, cultural, or social resources in Grand Teton National Park.

<u>Alternative 2 – Proposed Action</u>

This alternative is expected to net benefits that considerably outweigh any short-term adverse effects in the interest of protecting structures. Although this alternative may have minor adverse

impacts to air quality, vegetation, and wildlife, it indirectly has moderate beneficial effects to cultural resources and firefighter and public safety. Because the proposed action does not pose any significant, adverse, direct or indirect impacts to natural and cultural resources, Alternative 2 would not result in impairment to natural, cultural, or social resources in Grand Teton National Park.

Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Teton National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's master plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

4.0 CONSULTATION AND COORDINATION

PUBLIC SCOPING AND ISSUES

A scoping brochure was prepared in April 2003 and mailed to approximately 200 agencies, interested organizations, and individuals. The scoping notice contained a one-page response form for readers to complete and return to the National Park Service at GTNP. The response forms were designed to provide respondents an opportunity to provide comments on the project and to ensure that future mailings were sent to those indicating an interest in the project. Grand Teton issued a press release on April 14, 2003, announcing the initiation of the scoping period for the project and the date for the public scoping open house. Scoping flyers were also posted around the towns of Jackson, Wilson, Moose, Kelly, and Moran. An advertisement flyer was published in the Jackson Hole Daily News and the open house was announced on the local National Public Radio station.

The public scoping open house was held on April 24, 2003, in Jackson, Wyoming. No formal presentation was made, but representatives from National Park Service (NPS), U.S. Forest Service, and Jackson/Teton County were present to answer questions and solicit comments on the project. A total of 13 individuals attended the workshop. Interested parties were asked to submit written comments by May 4, 2003. One written comment was received during the public workshop and two comments were received by mail. In general, these comments and several other verbal comments received were risk-based and in support of reducing fuels in these seven project areas, in addition to other areas to be considered in the future. No concerns were raised regarding any major environmental impacts associated with the proposed action.

AGENCIES AND PEOPLE CONSULTED

Organizations and agencies contacted for information or that assisted in identifying important issues, developing alternatives, or analyzing impacts include:

Federal, State, and County Agencies

National Park Service – Yellowstone National Park
U.S. Fish and Wildlife Service, Michael Long, Field Supervisor
U.S. Department of the Interior, Fish and Wildlife Service, Ecological Services, Cheyenne Office
Wyoming Department of Environmental Quality
Wyoming Game and Fish Department
Wyoming Office of Federal Land Policy
Wyoming Department of State Parks and Cultural Resources—State Historic Preservation Office
Teton County Fire Department

Affiliated Native American Tribes

Crow Tribal Council
Northern Arapaho Business Council

Northern Cheyenne Tribal Council
Eastern Shoshone Business Council
Shoshone-Bannock Tribes

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Jacquelin St. Clair, Archeologist
Jackie Skaggs, Public Affairs Specialist

U.S. Department of the Agriculture, U.S. Forest Service

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LIST OF ENVIRONMENTAL ASSESSMENT RECIPIENTS

Federal Agencies

U.S. Fish and Wildlife Service
Advisory Council on Historic Preservation
U.S. Army Corps of Engineers
U.S. Department of Agriculture, Bridger-Teton National Forest and Targhee National Forest
U.S. Department of the Interior, Fish and Wildlife Service, Cheyenne Office
U.S. Department of the Interior, Fish and Wildlife Service, National Elk Refuge & Fish Hatchery
U.S. Department of the Interior, Bureau of Land Management, Cheyenne and Pinedale
U.S. Department of the Interior, Bureau of Reclamation, Boise and Moran
U.S. Department of the Interior, National Park Service, Yellowstone National Park
U.S. Postal Service, Moose and Kelly
Greater Yellowstone Ecosystem Interagency Visitor Center

State and Local Agencies

Idaho Falls Chamber of Commerce
Jackson Hole Chamber of Commerce
Jackson Hole Historical Society
Pinedale Chamber of Commerce
State Historic Preservation Office
Teton County Library
Teton County Planning Office
Teton County Commissioners
Teton County Historic Preservation Board
Wyoming State Library
Wyoming Game and Fish Department
Wyoming Department of Transportation
Wyoming Department of Environmental Quality
Wyoming Dept. of State Parks and Cultural Resources
Town of Jackson

Affiliated American Indian Tribes

Crow Tribal Council
Northern Arapaho Business Council
Northern Cheyenne Tribal Council
Eastern Shoshone Business Council
Shoshone-Bannock Tribes

Non-Government Organizations

Audubon Society
Star Valley Development Association
State News Service
Teton Conservation District
Teton Group of the Sierra Club
Teton Science School
The Wilderness Society, Idaho, Montana
Utah Wilderness Association
Wenk Associates
Wilderness Watch
Wyoming Public Radio
Yellowstone Association

Individuals

Due to the large number of individuals receiving this EA, their names have not been listed. The list of individuals and additional organizations that received the environmental assessment is kept in the project file and is available from the planning office in Grand Teton National Park.

REFERENCES AND LITERATURE CITED

Appendix H lists references used and literature cited.

APPENDIX A

LEGAL AND POLICY FRAMEWORK

National Fire Plan

The National Fire Plan addresses five key points: Firefighting; Rehabilitation and Restoration; Hazardous Fuel Reduction; Community Assistance; and, Accountability. The fuels management and reduction focus is critical to the Plan. Fuels management activities will incorporate treatments necessary to change the stand condition class (which reflects the level of damage that would result from a wildland fire on those lands) from a higher risk condition class to lower risk and to maintain those areas in which a desirable condition class has been established.

In addition, activities will focus on Wildland-Urban Interface (WUI) areas that have been identified in a community based collaborative effort with a goal to reduce risk to people and property. The National Fire Plan's goals and guiding principles are to: Improve Fire Prevention and Suppression, Reduce Hazardous Fuels, Restore Fire-Adapted Ecosystems, and Promote Community Assistance. This fuels reduction project is proposed in response to the fuels reduction element of the National Fire Plan and the 10-Year Comprehensive Strategy.

National Park Service Fire Management Plan

The authority for implementing wildland fire management plans is found in the National Park Service (NPS) Organic Act (16 USC1, August 25, 1916), the 1976 Authorities Act (16 USC la), and is further clarified in the National Parks and Recreation Act of 1978. Related statutory authorities are the Clean Air Act, the Clean Water Act, the Endangered Species Act, the National Environmental Policy Act, the Antiquities Act, and others.

NPS Management Policies (2001) direct individual parks to manage natural resources, and to maintain, rehabilitate, and perpetuate their inherent integrity. One of the primary objectives is to manage all natural resources under ecosystem concepts that maintain and perpetuate natural systems rather than individual species or features. The Fire Management Plan for GTNP is currently being revised and will include an update of the 1991 Hazard Fuel Management Plan.

GTNP Master Plan

The Master Plan for Grand Teton National Park (1976) identifies the restoration of natural fire regimes in the park as a major management initiative. The plan identifies several broad resource management objectives including conserving wildlife, identifying and preserving significant natural and cultural resources, and managing the natural environment to enhance scenic values. The Statement for Management guidelines state that all park resources will be managed under ecosystem concepts and identifies fire as a critical resource management issue.

GTNP Resource Management Plan

To achieve these park management objectives, the Resource Management Plan for the park recommends that natural-caused fires be allowed to burn within designated areas, except when this would endanger life or property, or would result in unacceptable social, environmental, or economic impacts, or violate air quality regulations. These plans also recommend use of prescribed fires under specific conditions. This Wildland Fire Management Plan provides specific operating procedures for achieving this objective.

APPENDIX B

IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

Some impact topics were not considered beyond their identification as a topic because they either do not exist, they are not within or in proximity to the effected area, or impacts are unlikely. Based on site-specific conditions, several of the candidate impact topics were dismissed from further consideration. The rationale for dismissing impact topics is given below.

Ethnographic Resources: Ethnographic resources are defined by NPS Policy as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it." An ethnographic overview and assessment for Grand Teton National Park has not yet been completed. Communication with tribes traditionally associated with the Jackson Hole Valley is conducted during this planning process. Archaeological and ethnographic evidence indicate that Native Americans used the Jackson Hole area, including the present-day park as early as 8,000 to 10,000 years ago. The American Indian Religious Freedom Act of 1978 and the Native American Graves Protection and Repatriation Act of 1990 defined and strengthened the rights of Native American Indians and clarified the responsibilities of federal agencies regarding these types of cultural resources. The only ethnographic resource identified to date in GTNP is Mormon Row. Because none of the project locations are in Mormon Row and none of the five tribes contacted identified or expressed a concern regarding ethnographic resources, these resources were dismissed from further analysis.

Cultural Landscapes: A cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions. The 1999 Region-wide Level 0 Cultural Landscape Inventory did not identify any of the areas within the project locations as potential cultural landscapes, other than Bar B C Ranch. Because Bar B C has not been evaluated yet and the secondary objective of the fuels reduction project is to restore the cultural landscape to a more historical condition by mowing, no adverse impacts are anticipated. On the contrary, beneficial impacts are expected and the implementation plan will require consultation with the Park Historian to identify specific vegetation that may contribute to the potential cultural landscape. Therefore, these project activities will have no adverse effect to potential cultural landscapes and were dismissed from further analysis.

Museum Objects: NPS Policy requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material). All GTNP museum objects are located at one of three locations: the Colter Bay Visitor Center and Indian Arts Museum, the Beaver Creek Bally Building, or the Moose Visitor Center. Therefore, these project activities will have no effect to museum objects and were therefore dismissed from further analysis.

Natural Soundscape/Noise: The seven project areas are relatively urbanized, and there is little expectation by visitors of experiencing a natural soundscape. Sounds associated with the mechanical treatments would slightly change the levels of human-caused noise at these sites on a very short-term basis and can be mitigated to almost no effect with proper timing and communication with residents and visitors. Therefore, this topic was dismissed from further analysis.

Soils and Geology: Only soil within the center of the burn piles will be impacted. These pile areas are small (8-12 ft. radius) and number several per acre. Soils in the burn piles generally show evidence of regeneration after a year or two, with demonstration of full regeneration after 10-12 years. Effects to soil productivity or fertility are slight, relatively short-term and would occur in very small volumes in comparison to the overall treatment areas. Hence, impacts are negligible and the topic was dismissed.

Water Quality and Hydrology: Water use is not planned as part of these projects in volumes that would affect water hydrology or cause any measurable runoff. The fuels reduction projects involve mechanical treatment and pile burning. The project areas will be thinned, but not flattened such that little original vegetation is not left to absorb water runoff from rain. Mechanical treatments will leave sites in such a condition that the remaining vegetation will continue its natural process of water absorption, thus not contributing to erosion and runoff. Therefore, this topic was dismissed from further analysis.

Wetlands and Floodplains: None of the alternatives would affect a floodplain or wetland that is regulated under provisions of §404 of the Clean Water Act. Therefore, this topic was dismissed from further analysis.

Wilderness: None of the seven project areas are within proposed wilderness, and all but one are located within a few miles from proposed wilderness. The project site closest to proposed wilderness is the Fabian Ranch area, still about a mile from the wilderness boundary. Therefore, the wilderness area would not experience any disturbance or additional noise from fuel reduction operations, thus was dismissed from further analysis.

Indian Trust Resources: There are no Indian trust resources in the project areas.

Visitor Use and Experience: These projects have the potential to affect visitors in three ways: 1) smoke causing reduced visibility, which is addressed under air quality; 2) visual impacts from the thinning, mowing and pile burning in the project areas; and 3) restricted access during operations. Access to these projects will not be limited, except to the immediate operations areas. The complexes that currently allow visitation will continue to remain open during treatment operations. If access is restricted, it will be mitigated with education, public announcements and web postings. The number of piles burned per day will be limited to ensure that visibility is not reduced or adversely impacted. Existing education programs will mitigate residential and/or visitor concerns. The mowing at Bar B C will restore the viewshed back to historical reference. Because these impacts are negligible and relatively short term for the visitors, this topic was dismissed from further analysis.

APPENDIX C

AFFECTED ENVIRONMENT CHARACTERIZATION AND REGULATORY REQUIREMENTS

Air Quality

As required by the Clean Air Act (42 U.S.C. 7401 et seq., Section 165), the Environmental Protection Agency has developed National Ambient Air Quality Standards (NAAQS) for six pollutants: carbon monoxide, nitrogen oxide, sulfur dioxide, lead ozone, and particulate matter. These standards must be met in the ambient air; that is, anywhere the public has access. The act established a national visibility protection goal to eliminate existing and prevent future visibility impairment in specially designated areas, known as Class I areas, in the United States. Grand Teton National Park is in a Class 1 air shed. The Clean Air Act also gives states the primary responsibility for designing and implementing regulations to assure NAAQS are met. Wyoming's State Implementation Plan (SIP) outlines the requirements for protecting the air shed of the state. The Wyoming Air Quality Division requires a permit for all management ignited prescribed fires in order to control and maintain the high quality air shed and visibility standards of the past and present. The Simple Approach Smoke Emissions Model (SASEM) is used to analyze effects to downwind receptors to determine whether to issue a permit.

Archaeological Resources

Grand Teton National Park encompasses a variety of archeological resources. Both prehistoric and historic resources can be found in the park. Although less than 10% of the lands within the park have been surveyed, previous archaeological surveys within the park and on adjacent lands suggest a seasonal settlement pattern for the Jackson Hole area. Early Native American people made their living by hunting animals and gathering roots, bulbs, berries, and seeds. Thus, their economy has been characterized as "hunting and gathering," but this existence cannot be further characterized as "simple." The park's prehistoric sites represent a wide range of plant, animal, and stone procurement locations, seasonal camps and plant processing features that represent more than 10,000 years of human use in Jackson Hole.

Historic Structures

McCollister: The McCollister Residential Complex was determined eligible for listing in the National Register of Historic Places on January 31, 2001 by the Wyoming State Historic Preservation Office (SHPO). It is significant for its association with Paul W. McCollister, the mastermind behind the resort complex development at Teton Village otherwise known as the Jackson Hole Ski Resort.

Fabian Ranch: The Geraldine Lucas Homestead/Fabian Place was listed in the National Register on August 24, 1998. It is significant for its association with western settlement/agricultural development and with regional conservation.

Blacktail North: Three of the four properties on the north side of Blacktail Butte are private inholdings, and have not been evaluated for listing in the National Register. The fourth property, the Dick and Ethel Reimer Residence, was determined eligible for listing in the National Register on May 15, 1998 by the Wyoming SHPO. The Reimer Residence is significant as an example of Jackson Hole vernacular architecture of the late settlement period (ca. 1927-1945).

Bar B C Dude Ranch: Bar B C Dude Ranch was listed in the National Register on April 23, 1990. It is significant because as a dude ranch it helped define and set the standards for the local Jackson Hole industry, and for its association with Struthers Burt, a local author and industry leader of dude ranching.

Oxbow Housing (Jackson Lake Ranger Station): Jackson Lake Ranger Station was listed in the National Register on April 23, 1990. The ranger station is significant because it represents the last *in situ* U.S. Forest Service ranger station in Grand Teton National Park that dates to the Great Depression, and the redevelopment of facilities by the U.S. Forest Service after establishment of the park.

Moran: The Snake River Land Company Residence and Office was listed in the National Register on July 17, 1998. It is significant for its association with consolidation of private lands in Jackson Hole and with the extension of Grand Teton National Park, as well as for its vernacular architecture. The twelve buildings located in the small community of Moran are either less than fifty years old, making them unlikely to be eligible for listing in the National Register, or the Wyoming SHPO declared them ineligible for listing in the National Register on July 21, 1989. The Buffalo Fork Ranger Station was determined ineligible for listing in the National Register by the Wyoming SHPO on July 21, 1989. The Moran Entrance Kiosks (2) were constructed in 1959, and are unlikely to be eligible for listing in the National Register because they are less than fifty years old.

Jackson Lake Dam*:* The Bureau of Reclamation housing district is ineligible for listing in the National Register because the residence, crew quarters, and garage are not associated with a significant event or events in American history, the property is not associated with a significant person, the buildings are not architecturally significant, and the property is not likely to yield important information regarding American history. This site is the only site that does not have any historic structures.

Wildlife and Habitat (Including Threatened, Endangered, and Special Concern Species)

Bald Eagle (Haliaeetus leucocephalus)
Grand Teton National Park lies within the Greater Yellowstone Recovery Area and contains 9 known nesting territories and pairs; however, not all pairs nest in the park each year. Known territories are along the shorelines of the Snake River and Jackson Lake. In the park, the Snake River and adjacent riparian area is used by as many as six pairs of eagles for nesting and foraging. Bald eagles that nest along the Snake River may remain on their nest territories throughout the year, occasionally leaving for short periods during the non-breeding season to exploit abundant or ephemeral food sources elsewhere. Eagle nests are within one- mile of three of the seven project locations: Oxbow Housing, Jackson Lake Dam and Moran Housing. Bald eagle management in the park involves annual nest surveys, seasonal area closures around bald eagle nest sites to protect them from human disturbance, and monitoring of annual nest territory occupancy and productivity.

Canada Lynx (Lynx canadensis)
The primary forest types used by lynx in the western United States are lodgepole pine, Engelmann spruce and subalpine fir. The forest cover should consist of a variety of stand ages and structures in order to provide both denning and foraging habitat. Removal of coarse woody debris by salvage harvesting and prescribed fire may affect the survival of lynx kittens. Lynx use a variety of forest age and structure classes within dynamic forest ecosystems. Late seral forests provide denning habitat and produce red squirrels, while snowshoe hares generally reach highest abundance in younger seral stages. The spatial and temporal interspersion of habitat is influenced both by natural disturbance events, such as wind and wildland fire, and by vegetation management activities, including timber harvest and prescribed fire. Because lynx occur at low densities and occupy large home ranges, conservation objectives cannot be achieved on small parcels of land (McKelvey et al. 2000a).

Lynx seem to prefer to move through continuous forest, using the highest terrain available such as ridges and saddles (Koehler 1990; Staples 1995). Cover is important to lynx when searching for

food (Brand et al. 1976) but lynx often hunt along edges (Mowat et al. 2000). Kesterson (1988) and Staples (1995) reported that lynx hunted along the edges of mature stands within a burned forest matrix, and Major (1989) found that lynx hunted along the edge of dense riparian willow stands. Lynx have been observed (via snow tracking) to avoid large openings (Koehler 1990; Staples 1995) during daily movements within the home range. Recent attempts to determine if lynx are present in the park using hair snares and tracks found no hairs or tracks from this species. (S. Pyare, Wildlife Conservation Society, pers. com. 2001). There is only one known occurrence of Lynx in the Park and that was a radio-collared animal passing through the northern most portion of the park. Three of the seven project locations are located in suitable Lynx habitat within identified Lynx Analysis Units (LAUs), while the other four project areas are not located within established LAUs.

Grizzly Bear (Ursus arctos horribilis)

Grizzly bear management within GTNP is governed by the park's *Human-Bear Management Plan* (NPS 1989) and the Interagency Grizzly Bear Guidelines (USFS 1986). Grizzly bears have increased from relatively uncommon to common in Grand Teton National Park during the last 10 years, in conjunction with a steady trend toward increasing bear density in the southern Greater Yellowstone Area (GYA). In the Teton Range, they are regularly sighted north of Moran Canyon and the Badger Creek drainage, where visitor use of the backcountry occurs at relatively low levels. On the Jackson Hole valley floor, they are common north of the Triangle X ranch, and have been observed south of there in the Snake River drainage on several occasions. Home ranges of 27 radio-collared bears from 1975–1998 have included parts of GTNP and/or the John D. Rockefeller, Jr. Memorial Parkway. Approximately 125,000 acres of Grand Teton National Park lie within the grizzly bear recovery zone, however grizzly bears could be found in any part of the park. Although bears may be found in almost any part of the park and even within the project areas, these project sites are relatively small and fairly urbanized.

Gray Wolf (Canis lupus)

First released in Yellowstone National Park in March 1995, individuals from this experimental population began to disperse into GTNP in 1997, and established the park as part of their home range during the 1998-99 winter seasons. Three packs have used areas within the park from Pacific Creek to the National Elk Refuge and the Gros Ventre River basin. Wolf packs now occur throughout the central GYA, including areas north and east of the parks. Depending upon prey abundance, wolves in Grand Teton may occupy a variety of habitats including grasslands, sagebrush steppes, coniferous and mixed forests, and alpine areas. Ungulates are a primary food source, at times accounting for more than 90% of the biomass consumed by wolves. Although habitat for both ungulates and smaller mammals occur in the project areas, these site locations are very small and fairly urbanized.

Mountain Plover (Charadrius montanus)

The mountain plover is a small bird associated with shortgrass prairie, plains, alkali flats, agricultural lands, cultivated lands, sod farms, prairie dog towns, and shrub-stepped landscapes at both breeding and wintering locales. Plovers may nest on sites where vegetation is sparse or absent, or near closely cropped areas, manure piles or rocky areas. They are rarely found near water and show a preference for previously disturbed areas or modified habitat (USFWS 2003). Although this type of habitat exists in GTNP, no critical habitat for mountain plovers has been delineated within the boundaries of the park. No mountain plovers have been observed within the park to date through formal and informal bird surveys and counts.

Sage Grouse (Centrocercus urophasianus)

The Wyoming Game and Fish Department (WGFD) identifies sage grouse as a "Species of Special Concern" (WGFD 2003). Potential habitat at Bar B C and Fabian Ranches is very small and considered unsuitable because sage grouse do not in inhabit these areas and prefer other locations.

APPENDIX D

TABLE 2 – SUMMARY COMPARISON OF IMPACTS OF THE ALTERMATIVES

Impact Topic	Alternative 1 (No Action - No Pre-Fire Treatment)	Alternative 2 (Mechanical Fuels Treatment w/Pile Burning)
Air Quality	Negligible, neither beneficial nor adverse, direct, local effects in the short term if no fire occurs. Adverse, indirect, moderate effects of short duration in the event of a wildfire. No impairment of air resources.	Adverse, direct, minor local effects of short duration from smoke and visibility impacts. No impairment of air resources.
Cultural Resources (Archeological Resources and Historic Structures)	Negligible, neither beneficial nor adverse, direct, local effects in the short term if no fire occurs. Adverse, indirect, moderate effects of long duration to historic structures in the event of a wildfire. No impairment of cultural resources or values.	Negligible or no effect to archeological resources in the short term. Beneficial, indirect, moderate effects of long duration to historic structures in the event of a wildfire. Coordination with the Wyoming SHPO will be conducted to ensure Section 106 compliance. No impairment of cultural resources or values.
Vegetation (Invasive and Nonnative Species)	No additional spreading of nonnative or invasive species would occur in existing vegetation. Adverse, indirect, moderate effects of long duration to vegetation in the event of a wildfire. No impairment of vegetation resources.	Adverse, direct, minor, short-term, local effect from the loss of several small burn pile areas of previously undisturbed vegetation, thus increasing the potential for the spread of nonnative and invasive species. No impairment of vegetation resources.
Wildlife and Habitats (Including T&E and Special Concern Species)	No changes would occur in wildlife populations or their supporting habitats in the short term. Long-term effects, in the event of a wildfire, include direct, adverse, moderate effects. Negligible or "no effect" directly or indirectly to species of special concern (sage grouse). Negligible or "no effect" directly to threatened or endangered species (bald eagle) in the short term. Long-term effects, in the event of a wildfire, include direct, adverse, moderate effects due to increased habitat loss potential. No impairment of wildlife resources or habitats.	Adverse, direct, minor, short-term and long-term, very localized effect on non-listed species such as burrowing animals and some ground-nesting birds and their habitat. Negligible or "no effect" directly to species of special concern (sage grouse) in the short term or long term, due to lack of suitable habitat in the areas of effect. Negligible or "no effect" directly to threatened or endangered species (bald eagle) in the short term or long term, due to conducting operations only between August 16-October 31 in areas within 1 mile of an eagle's nest. Over flights in these areas will be restricted as well. No impairment of wildlife resources or habitats.
Firefighter and Public Safety	Negligible, neither beneficial nor adverse, direct, local effects in the short term if no fire occurs. Adverse, indirect, moderate effects of short duration to the risk of firefighter and public safety in the event of a wildfire. No impairment of human health or safety.	Beneficial, indirect, moderate effects of long duration to firefighter and public safety in the event of a wildfire. No impairment of human health or safety

APPENDIX E

MECHANICAL REMOVAL STANDARDS FOR LODGEPOLE PINE/MIXED CONIFER

Ground Fuels:
- Reduce ground fuels to 10 tons/acre.
- Sound wood may be piled in log decks and rotten logs placed in slash piles.
- Remaining ground fuels left should be limbed, with no stubs less than 1 inch high.

Thinning:
- Thin stems (boles or trunks) or groups of stems to a spacing distance of 12 feet between trees. Try to maintain an irregular distribution across the treatment area to maintain a more natural look.
- Leave no stumps higher than 2 inches on the uphill side.
- Preferentially remove snags and sub-alpine fir (*abies lasiocarpa*).
- Clumps of even-aged regrowth should be no bigger than 12 feet in diameter with 12 foot corridors separating clumps. Remove seedlings within regrowth clumps (remove all 1 inch and under).
- Use proper thinning techniques, flush cut all stumps to no more than 2 inch high with no angle cuts left (no pongee sticks).
- Leave wildlife snags within the treatment area, but fall other standing dead trees that will help achieve the 12 feet thinning standard.

Pruning:
- On mature trees (DBH > 6"), prune with a pole saw limbs that reach to within 12 feet of the ground.
- On smaller trees (DBH < 6"), prune with a pole saw or loppers to 12 feet or ½ the tree height.
- Use proper pruning techniques, leave no stobbs > than ½ inch from the bole of the tree, and minimize scarring to the bole of the tree. Prune branches just outside of the bud swell.

Pile Construction:
- Choose pile location with 20-30 foot flame lengths in mind.
- Locate piles in natural openings or within thinning corridors.
- Construct piles for burning. Use fine flashy fuels such as small trees and limbs for the base of the pile and add on vertically.
- Do not allow piles to grow horizontally because these piles will require much more tending work while burning.

Evaluation:
- Determine how well the crew has completed an area by using methods for estimating ground fuel loading to judge how much dead and down fuel remains within the area. Brown's fuel loading transects or ocular estimates using photo series may be used to record pre and post project fuel loading in tons/acre.
- Count piles. Count both log decks (if applicable) and slash piles on a weekly basis so that completion reports and the firewood program can be initiated.

APPENDIX F

FUELS PROJECT TREATMENT DESCRIPTIONS

The following seven projects will be treated to reduce hazardous wildland fuel accumulation in order to provide for greater fire management containment options.

This appendix describes specific work to be done at each project location. Mitigation measures identified in the Appendix G will be included in the final implementation plan for these projects. Appendix E outlines the treatment standards for maximizing effectiveness in various fuel types. Since a variety of habitat types and stand structures exist, these standards are modified to fit each treatment area and address project specific issues.

Blacktail North:
Douglas fir stand on the north slope of Blacktail Butte will be treated to aid in protecting private inholdings in the event of wildland fire on Blacktail Butte.

Jackson Lake Dam:
Mixed conifer, lodgepole pine, and Douglas fir along the north slope of Signal Mountain will be treated to aid in protecting structures associated with the Jackson Lake Dam. The proposed treatment is:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Ladder fuel removal up to 10 feet or half the height of the tree. Targeted ladder fuels are limbs or low branches that reach to the ground providing an avenue for fire to move from the ground into tree crowns. Tall shrubs may also act as ladders but will not be specifically targeted with this treatment. Some shrub removal may be completed to allow for safe working and pile placement.
- Regeneration reduction focusing on trees 0-3 inches in diameter to create 10-12 feet between individual trees or groups of trees. This treatment area contains little regeneration in the 0-3 foot height class but moderate to heavy regeneration in the "pole" category 10+ feet in height.
- Maintain/create overstory tree spacing of 10-12 feet between tree stems. This stand is currently stocked to higher densities, which will require thinning of overstory trees to reduce the possibility of active crown fire.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 8-10 feet in diameter at a density of 10-12 piles/acre based on pre-treatment estimates.

McCollister:
Aspen stand with some conifer regeneration on the west side of Shadow Mountain in Antelope Flats. The treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Reduce conifer seedlings and poles within the aspen stand.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing most vegetation from around the

foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 8-10 piles/acre based on pre-treatment estimates.

Bar B C:
Combination mechanical thinning and mowing will reduce sagebrush densities and vegetation immediately adjacent to structures in the historic Bar B C Ranch area. The treatment priorities are:
- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Reduce conifer seedlings and poles within aspen stands.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.
- In areas of dense sagebrush, removal of sagebrush within 30 feet of the structure should be combined with thinning sagebrush for an additional 40-70 feet outside the cleared area. Thinning should create clumps of sagebrush separated by open areas with clump size no larger than 15 feet in diameter and openings no less than 15 feet.
- Prescribed burn project will extend the defensible space to the south of the development.

Material produced will be piled in natural openings and clearings and allowed to cure for 2 summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 4-5 piles/acre based on pre-treatment estimates.

Fabian Ranch:
Cottonwood and conifer riparian area with aspen and conifer regeneration will be treated adjacent to the structures associated with the Fabian Place. The treatment priorities are:
- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction

Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 4-5 piles/acre based on pre-treatment estimates.

Oxbow Housing (Jackson Lake Ranger Station):
Lodgepole pine/mixed conifer will be treated adjacent to structures associated with NPS housing and historic structures. Treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Ladder fuel removal up to 10 feet or half the height of the tree. Targeted ladder fuels are limbs or low branches that reach to the ground providing an avenue for fire to move from the ground into tree crowns. Tall shrubs may also act as ladders but will not be specifically targeted with this treatment. Some shrub removal may be completed to allow for safe working and pile placement.
- Regeneration reduction focusing on trees 0-3 inches in diameter to create 10-12 feet between individual trees or groups of trees. This treatment area contains little regeneration in the 0-3 foot height class but moderate to heavy regeneration in the "pole" category 10+ feet in height.
- Maintain/create overstory tree spacing of 10-12 feet between tree stems. This stand is currently stocked to higher densities, which will require thinning of overstory trees to reduce the possibility of active crown fire.
- Reduce/remove vegetation immediately adjacent to structures to limit fire extension from wildland fuels to structures. This includes removing vegetation from around the foundation of buildings, overhanging trees and branches of any species or life form (trees or shrubs). Landscaping will optimize spacing and distribution using existing vegetation.

Material produced will be piled in natural openings and clearings and allowed to cure for two summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 8-10 piles/acre based on pre-treatment estimates.

Moran:
Lodgepole pine forest around the NPS housing area and the Snake River Land Company residence (also known as the Buffalo Dorm) at Moran will be treated. The treatment priorities are:

- Dead and down fuel removal across the treatment area so that no more than 10 tons/acre or less remain after pile burning. This remaining dead and down fuel will be retained on the site as a wildlife habitat component, but will be limbed to reduce fuel bed depth.
- Remove/reduce conifer regeneration where it is dense so that some regeneration remains to continue to provide visual screening for the residences from the road. This will generally mean reducing regeneration clumps by about ½ their original density.
- Remove damaged and dead overstory trees to facilitate regeneration of the stand and reduce potential receptors for spot fires.

Material produced will be piled in natural openings and clearings and allowed to cure for 2 summers. Once cured, these piles will be burned in accordance to the approved "Fuel Reduction Piles" Prescribed Burn Plan. Piles in this site will average 6-8 feet in height and 6-8 feet in diameter at a density of 8-10 piles/acre based on pre-treatment estimates.

APPENDIX G

MITIGATION MEASURES AND PROJECT STIPULATIONS

Air Quality

Grand Teton fire management is required to coordinate with the State of Wyoming when seeking a permit to burn. For a permit, smoke modeling is conducted using the Simple Approach Smoke Estimation Model (SASEM). The model calculates maximum concentrations and distances to receptors which the state uses to determine whether conditions are suitable to issue a burn permit. The State monitors all burns in the regional area to ensure cumulative burning effects do not result in exceeding the state air quality standards. The park will strive to burn only under favorable atmospheric conditions, provide advanced notification to residents and visitors, allow fuels to cure completely to reduce smoke, sell firewood to reduce heavy fuels being burned, limit number of piles burned per day or any combination thereof to minimize smoke impacts.

Archeological Resources

Project implementers and all fire personnel on site will be made aware of the standard stipulation that should archeological remains be uncovered during implementation of the proposed action, the appropriate state and federal regulatory agencies be contacted immediately. The seven separate reports stipulated that no heavy equipment be used at the project sites, except at Bar B C where mowing is proposed. Furthermore, a historic trash dump (site 48TE1623) at Bar B C will be flagged and protected as requested in the report.

In order to mitigate archeological impacts, the park completed surveys of all seven project areas and have mapped out every cultural resource in the project areas. Consultation with the Park Archeologist and Park Historian helped develop a draft implementation plan with flagged areas of concern to ensure certain resources remain undisturbed. Both specialists will conduct site visits prior to implementation to ensure all precautions are taken and all stipulations are being adhered to.

Vegetation

A park fire effects monitor will survey the areas to ensure that the burn piles are located in areas that have no evidence of species of special concern. Also, the Northern Colorado Plateau Network (NCPN) Invasive Plant Prevention Guidelines (April 2003) – *Invasive Plant Prevention in Fire Management Areas* will be used by fire management personnel to assure that all precautions are taken to minimize the spread of weeds. The park will conduct pre-fuel treatment inventories and monitor and treat as necessary nonnative species to reduce to risk of spreading. Monitoring of post-treatment regeneration will show if objectives are met and indicate wildlife habitat benefits and changes in use patterns.

Wildlife and Wildlife Habitat

Various mitigation measures specific to this project are proposed in the Biological Assessment (BA) that will be inserted in the proposed action implementation plan, including:

- Crews will be advised that they are working in bear country, that their lunches and other attractants will be properly stored at all times, and all food materials, garbage, and other attractants must be packed out on a daily basis.
- Conduct pre-treatment inventories, monitor and treat as necessary non-native species to reduce the risk of spreading.

- Follow standards and protocols and monitor wildlife for future prescription adjustments in order to minimize the potential effects to vegetation and wildlife by blow down, killing trees by limbing, disease, and burn piles scorching soils.
- Select specific times of the day and the week to use chainsaws and consider burning piles instead of chipping to minimize noise impacts on residents, visitors and wildlife.
- Where they are present, ¼ to ½ acre patches of dense seedling/sapling conifers (potential snowshoe hare/lynx foraging habitat) will be maintained within the project area, when doing so will not compromise the objectives of the project.

Some of the park's on-going mitigation measures include a bald eagle management that involves annual nest surveys, seasonal area closures around bald eagle nest sites to protect them from human disturbance, and monitoring of annual nest territory occupancy and productivity. Seasonal area closures usually occur from February 15 until August 15, and involve a 1-mile buffer zone around active bald eagle nests. Seasonal closures are also imposed for winter roost sites to provide protection from human disturbance from November 1 through April 15. If monitoring indicates disturbance to bald eagles, additional closures may be enacted.

GNTP is following the recommendations of the Lynx Conservation Assessment and Strategy and mapping lynx habitat. This draft map identifies the various habitats used by lynx (e.g., diurnal security, denning, and foraging) and their relationship to human activities. GTNP will continue to solicit and support research on lynx ecology. GTNP initiated lynx surveys in 2000 to assess the distribution and abundance of lynx in the GYA.

In spring of 2000, GTNP initiated a grizzly bear research project to assess bear abundance, distribution, and habitat selection, including the location of dens. The information obtained will assist park managers in protecting important habitats and planning recreational activities that minimize disturbance to bears. The park continues to remove carcasses from roads and roadsides and educate employees about packing out all food and other products.

Additional Operational Measures

- Conduct monitoring and evaluation of new growth to assess appropriate time and technique for the next treatment in order to minimize long-term follow-up and maintenance costs.
- Provide education and outreach both internally and externally on techniques and decision criteria to inform the public about the short-term visual impacts or aesthetics to anticipate. Help educate the public to change the perception that mechanical treatment is "unnatural."
- Refine and utilize SOPs to ensure proper personnel training and supervision to reduce risk of injury to personnel during treatment operations.
- At Blacktail North, make a special effort to educate and inform private residents that additional land treatment (by them) will be required in order to fully meet the purpose and need of this action, since treatment is not immediately adjacent to their structures.

APPENDIX H

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